



# Coastal Communications



## Ocean Response Coastal Analysis System (ORCAS)

ORD/NRL/NMOC/URI /U Cal-Santa Cruz/

WetLabs, Inc./SubChem Systems, Inc.

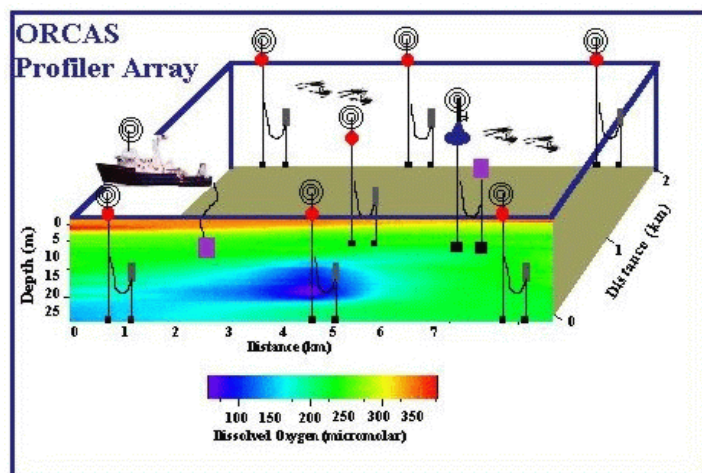


### Background

Harmful algal blooms (red tides, brown tides, etc.) and hypoxic events (loss of dissolved oxygen) are increasingly being observed in our coastal waters. Early detection and better measurement of these events are needed to understand their causes and to potentially prevent their environmental consequences (e.g., fish kills, beach closures, shellfish poisoning). The U.S. EPA's Office of Research and Development (ORD) is working in partnership with other federal agencies (Naval Research Laboratory (NRL), and Naval Meteorology & Oceanography Command (NMOC)), academic institutions (University of Rhode Island (URI) and University of California, Santa Cruz) and private industry (WetLabs, Inc., and SubChem Systems, Inc.) to provide real-time, high-resolution monitoring of multiple biological, physical, chemical, and optical measurements in coastal waters in 3-dimensional space. The Ocean Response Coastal Analysis System (ORCAS), a new system of autonomous, moored, instrumented platforms called profilers will be tested to evaluate its ability to provide these real-time measurements. If testing is successful, you will be able, in the near future, to access a web site that reports on environmental conditions in coastal waters as well as provides "now" casts and forecasts of harmful algal blooms and hypoxia. The ORCAS project is being conducted through the National Oceanographic Partnership Program and an Interagency Agreement between the ORD National Health and Environmental Effects Research Laboratory's Gulf Ecology Division (GED) and the Office of Naval Research.

### Approach

In September of 2001, twenty-eight partner scientists visited GED for the first field test of the ORCAS profilers. The field demonstration effort was conducted aboard the University of Texas research vessel *Longhorn* in the estuarine and marine waters around Pensacola, Florida. During this field demonstration, equipment and systems evaluations were conducted on the deployment, performance and recovery of the profilers, data communication links, and data storage and visualization systems.



Conceptual drawing showing the **Ocean Response Coastal Analysis System** deployed as an array of multiple **ORCAS** profilers. The depicted array is comprised of seven autonomous bottom-up Mini-profilers and one Maxi-profiler. The real-time data transfer and profiler control is supported by a radio telemetry system. The auxiliary sensor systems that will be deployed from the ship include URI's high-resolution profiler, NRL's optical profiling packages, EPA's fast repetition rate fluorometer instrument, SubChem's nutrient profiler, and acoustic doppler current profilers (ADCPs). A network of upward-looking ADCPs will be placed on the bottom to provide a continuous time-series of vertical current profiles over the horizontal scale of the array. NAVY divers are depicted transiting the optical sensor array during the planned diver visibility/vulnerability experiments.

### Further Information

For further information, please contact: Rick Greene at the ORD National Health and Environmental Effects Research Laboratory's Gulf Ecology Division at (850) 934-2497 or [greenes.rick@epa.gov](mailto:greenes.rick@epa.gov); or Percy Donaghay at the University of Rhode Island (401) 874-6944 or [donaghay@gso.sun1.gso.uri.edu](mailto:donaghay@gso.sun1.gso.uri.edu).